Seasonal and spatial variability in the European rabbit (*Oryctolagus cuniculus*) diet in relation to its population dynamics.

INTRODUCTION: Diet quality has been identified as a key regulator of the European rabbit population dynamics. Thus, it has been demonstrated the importance of spatial and temporal changes in the quality of available forage on the population abundance.

HYPOTHESIS: Areas with low population densities will have low qualities of diet and vice versa.

OBJECTIVES: To check which seasonal patterns are followed by population densities and the quality of food during a year and the relationship between these two values.

MATERIAL AND METHODS: Four hunting areas in the Province of Girona with different population densities were selected, where every three weeks for one year (May 2018-May 2019), its population densities were tracked by counting latrine pellets. At the same time, the quality of the diet was determined by collecting pellet samples and quantifying its FNM (faecal metabolizable Nitrogen) using NIRS (Near-infrared reflectance spectroscopy). The data were analyzed with the "R" software using GAM additive models.

RESULTS: FNM had a seasonal pattern: it had the highest values in January and the lowest in July (Figure 1). Hunting areas with higher densities showed a seasonal pattern, and hunting areas with lower densities did not. (Figure 2). The relationship between density and FN was negative. So, when there are more rabbits there is less protein content in the diet (Figure 3).

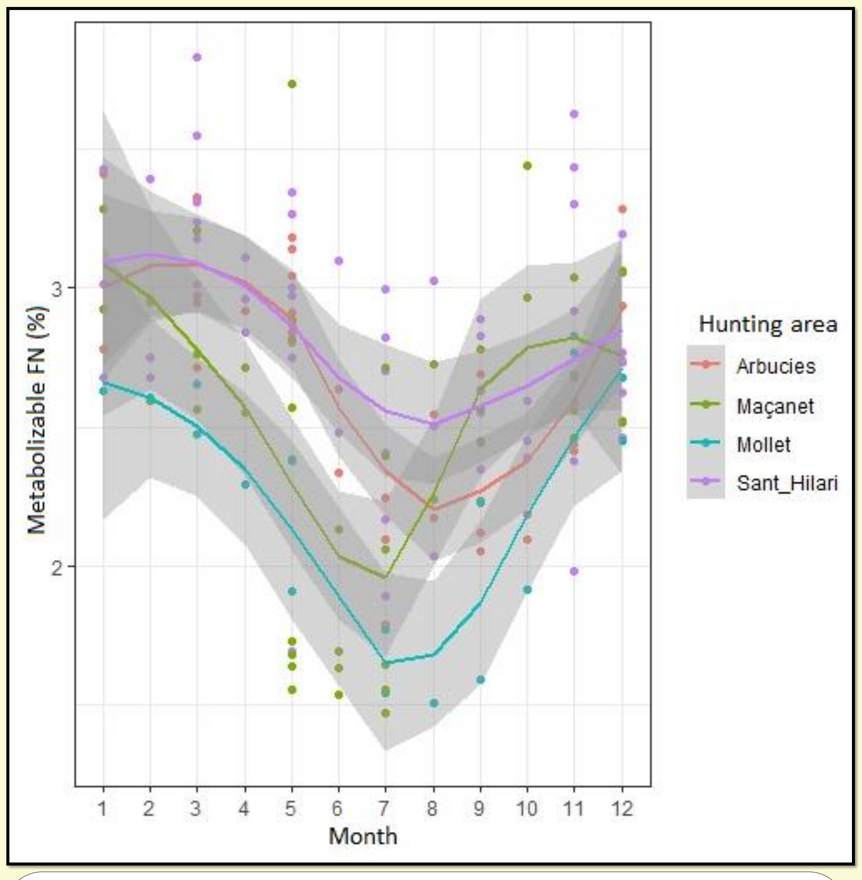

Figure 1. Evolution of NF metabolizable during the year studied (May 2018-May 2019).

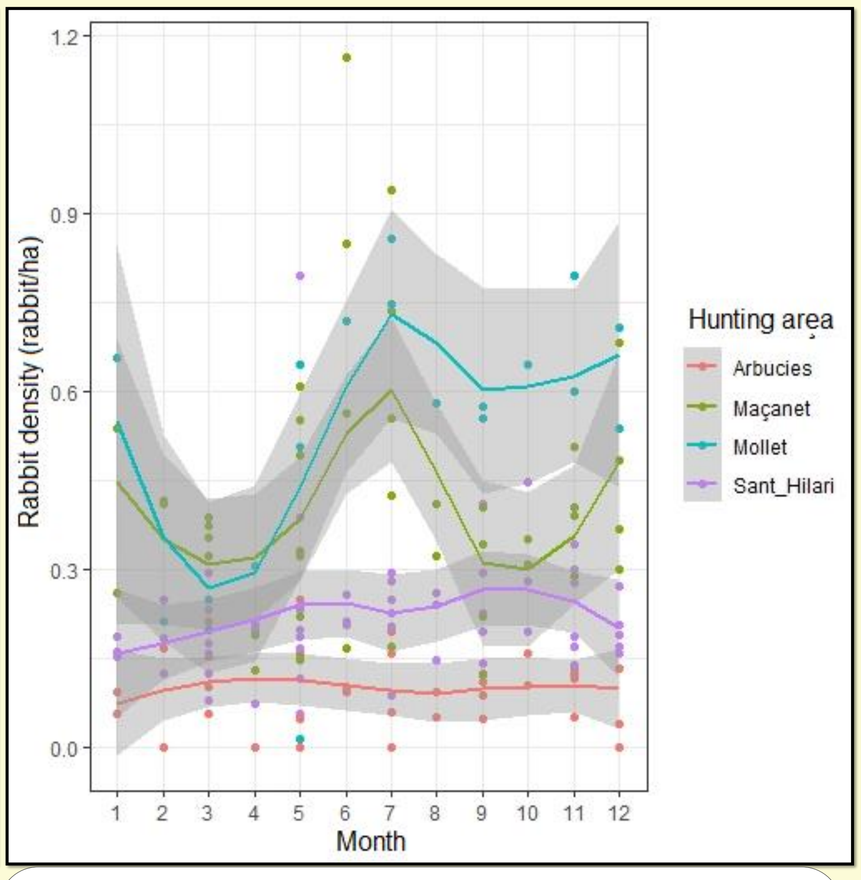

Figure 2. Evolution of the density of rabbits in the studied hunting areas. (May 2018-May 2019).

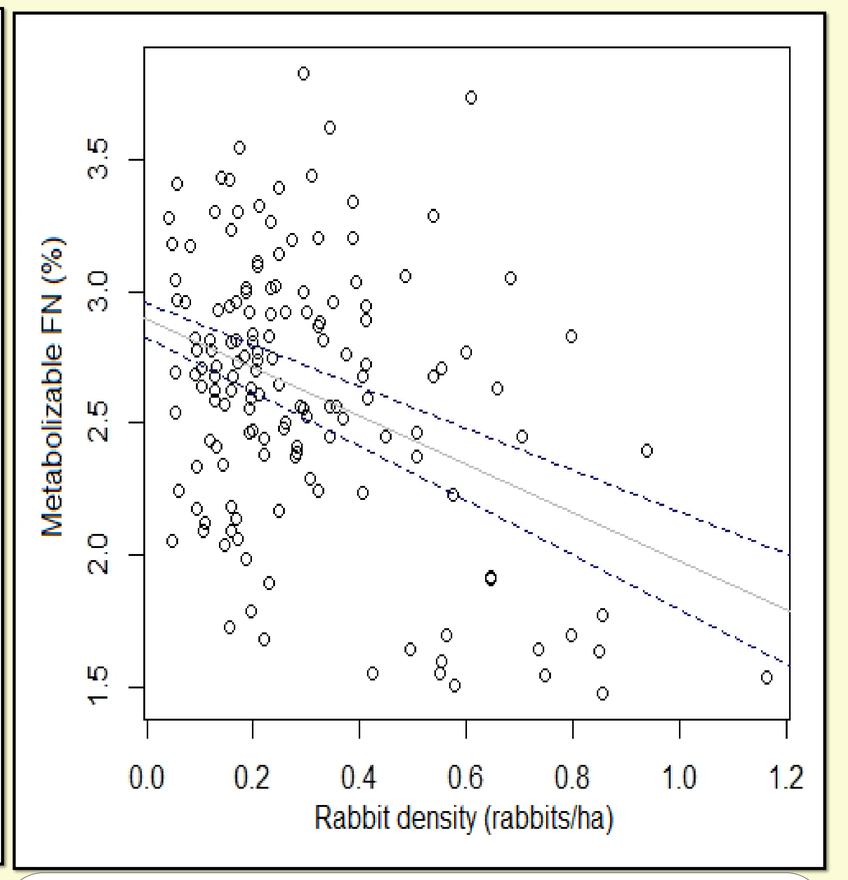

Figure 3. Relationship between metabolizable NF and population density. (slope = -0.91, p-value <0.001)

CONCLUSIONS:

- The indicators selected, FN and density, follow seasonal patterns and are inversely proportional. It has been observed that in summer season when the quality of food is the lowest, there are the highest population densities.
- The initial hypothesis is ruled out, since it has been observed that NFM values and population densities have a negative relationship.
- The study methodology developed in this work, applied in those territories that require accurate management of their rabbit populations, can be a useful tool for dynamics modeling population and at the same time to adapt their hunting plans.

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